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MAJ DE JONG MARLA J

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Consensus Conference on Sedation Assessment:

A Collaborative Venture by Abbott Laboratories, American Association of Critical-Care Nurses, and Saint Thomas Health System

Abbott / AACN / Saint Thomas Health System Sedation Expert Panel Members*

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Please address all correspondence to:

Marianne Chulay, RN, DNSc, FAAN
505 N. Boundary St.
Chapel Hill, NC 27514
919-932-9972
email: Chulay@aol.com

* Members of the Abbott / AACN / Saint Thomas Health System Sedation Expert Panel (alphabetical order):

Mary Kay Bader, RN, MSN, CCRN, CNRN
Neuroscience Clinical Nurse Specialist
Mission Hospital
27700 Medical Center Road
Mission Viejo, CA 92691
Phone: 949-364-1400, ext 4654 (office)
Email: MBADER@mhr.stjoe.org, badermk@aol.com

Suzanne M. Burns, RN, MSN, RRT, ACNP, CCRN, FAAN
Associate Professor of Nursing, Acute and Specialty Care
APN 2, Medicine/MICU

McLeod Hall School of Nursing
Box 800782
University of Virginia Health System
Charlottesville, VA 22903-3395
Phone: 434-924-2259
FAX: 434-982-1809
Email: smb4h@virginia.edu

Meg Campbell, RN, MSN, FAAN
Nurse Practitioner, Palliative Care and Clinical Ethics
Detroit Receiving Hospital
Nursing Administration
4201 St. Antoine
Detroit, Michigan 48201
Phone: 313-745-3271 (office)
FAX: 313-745-3637
Email: mcampbe3@dmc.org

Marianne Chulay, RN, DNSc, FAAN
Consultant, Clinical Research and Critical Care Nursing
505 N. Boundary St.
Chapel Hill, NC 27514
Phone: 919-932-9972
Email: Chulay@aol.com

Marla De Jong, RN, MS, CCNS, CCRN, CEN, Major
Doctoral Student
University of Kentucky, School of Nursing
Lexington, KY
Phone: 859-223-7265
Email: mdejong@aol.com

Dorrie Fontaine, RN, DNSc, FAAN
Associate Dean for Academic Programs
UCSF School of Nursing
2 Koret Way, 319G, Box 0604
San Francisco, CA 94143-0604
Phone: 415/476-9710
FAX: 415-476-9707
Email: Dorrie.Fontaine@nursing.ucsf.edu

Jill M. Luer, Pharm D
Medical Director
Helix Medical Communications
1400 Fashion Island Blvd, Suite 400
San Mateo, CA 94404
Phone: 303-904-9080

FAX: 303-904-9087
Email: jmluer@earthlink.net, jill.luer@helix-medcom.com

Kathleen Vollman, RN, MSN, CCNS, CCRN
Clinical Nurse Specialist/Educator/Consultant
ADVANCING NURSING
23613 Edward
Dearborn, MI 48182
Phone: 313-570-1450
Email: kvollman@comcast.net

Lorie Wild, PhD, RN
Director, Patient Care Services
University of Washington Medical Center
1959 Northeast Pacific
Box 356153 (Room AA-310)
Seattle, WA 98195-6153
Phone: 206-598-4626
Email: lwild@u.washington.edu

Title: Consensus Conference on Sedation Assessment: A Collaborative Venture by Abbott Laboratories, American Association of Critical-Care Nurses, and Saint Thomas Health System

Introduction

In August of 2002, a group of critical care experts met in Nashville, TN for a consensus conference on sedation assessment. The conference was made possible though a collaboration between the American Association of Critical-Care Nurses (AACN), Abbott Laboratories, and Saint Thomas Health System (Nashville, TN) to address the critical need for a valid and reliable sedation assessment scale for use in critically ill patients. The collaboration was initially envisioned to be a three phase process:

- Phase I: Convene a group of experts in sedation assessment to validate the state of the science surrounding sedation assessment and to recommend characteristics of an "ideal" sedation assessment scale.
- Phase II: Develop a new sedation assessment scale for critically ill adult patients.
- Phase III: Conduct a multisite clinical research project to test the validity and reliability of the new scale.

The members of the conference were selected based on their expertise in a variety of critical care arenas and aspects of sedation in order to get a broad perspective on the sedation needs in critical care practice. Members had expertise in medical, surgical, cardiovascular, neurosurgical, pediatric and adult critical care nursing and represented hospital practice from across the US. In addition, members were selected for participation in the panel based on expertise specifically relevant to sedation assessment, including pain management, anxiety/fear, sleep, patient-ventilator synchrony, delirium, clinical pharmacology, and sedation scale development.

This paper is a summary of the expert panel's perspectives on the current status of sedation assessment in critically ill patients and their recommendations for development of a new sedation assessment scale. A series of questions were posed to the expert panel members and their responses during the one day conference are summarized below.

Question: Are the available sedation assessment scales adequate for use in critically ill patients? Is there a need for a new sedation assessment scale?

In response to the question of whether the current sedation assessment scales published in the literature are adequate for use in critically ill patients, the panel members unanimously voiced that the scales are not adequate for use in most critical care situations. Weaknesses of the current scales include their lack of validity and reliability testing in critically ill patient populations; primary focus on evaluating agitation and consciousness; failure to address other reasons for sedation such as anxiety, comfort, ventilator synchrony, or sleep and rest; lack of discrimination between different levels of sedation seen in new sedative agents; and poorly developed levels that often include more than one aspect of sedation (e.g., agitation, anxiety, consciousness).

In a recent review of published sedation assessment scales, the authors found that out of 25 scales published from 1966 to 1999, only 3 scales had undergone more than a precursory effort at validity and reliability testing in adults:[1] the Ramsay Scale,[2] the Motor Activity Sedation Scale (MASS),[3] and the Sedation-Agitation Scale (SAS)[4]. While some testing of these scales had been reported, the expert panel concurred with DeJong and colleagues' conclusion that all of the scales had problems which would limit their usefulness for sedation assessment in a variety of critically ill patient populations.[1] Areas of concern related to the scales'narrow focus on agitation and/or consciousness, failure to separate assessment domains into separate subscales,

and the need for additional validity and reliability testing in different types of critical care situations.

Since that review, results of validity and reliability testing of the Richmond Agitation Sedation Scale (RASS) have also been published.[5,6] While the validity and reliability testing in the RASS has been done in a variety of critically ill patients, many of DeJong's criticisms of the Ramsay, SAS and MASS scales also pertain to the RASS. In addition, several experts have recently recommended that better sedation assessment scales be developed which evaluate more than one domain of sedation in a variety of critically ill patient populations.[7-11]

Box Insert #1

Kathleen Vollman, RN, MSN, Clinical Nurse Specialist/Educator/Consultant: "We currently use the MASS but prior to that we used the Ramsay Scale, which is inefficient because it lacks enough information on behaviors to guide medication administration. While the MASS is much better, it is primarily a motor assessment score so it has nothing to do with other reasons for sedation therapy, such as comfort, anxiety, or ventilator synchrony. The current sedation assessment scales do not get at all of the subcomponents which need to be evaluated when determining sedation therapy needs."

Meg Campbell, RN, MSN, FAAN, Nurse Practitioner, Palliative Care and Clinical Ethics at Detroit Receiving Hospital: "Current scales do not address individual patient goals for sedation – for example, facilitating mechanical ventilation, patient safety, comfort, or anxiety."

Panel members focused a great deal on the structure of the present sedation assessment scales as being too simplistic to adequately evaluate a complex array of symptoms in critically ill patients. The scales have only a single domain or subscale, with 3 (should this be 6?) to 10 different levels within that domain depending on the particular scale (Table 1). For the most part, the single domain of each of these scales evaluates only consciousness and/or agitation. Yet sedatives are used to manage a variety of physiologic and psychological symptoms or problems experienced during a critical illness, not just consciousness or agitation.[12-14] The most

common reasons for sedation administration are to relieve anxiety, relieve agitation, promote rest and sleep, create an amnesic state, promote hemodynamic stability, and prevent self harm. Sedation is less commonly used to reduce intracranial pressure, promote patient/ventilator synchrony, facilitate neuromuscular blockade, and prevent discomfort associated with invasive instrumentation (e.g., endotracheal tubes, chest tubes) and critical care management.

So while the simplistic assessment scales that are available today may be easy for clinicians to use, they will be woefully inadequate in assessing sedation needs in most critically ill patients. The nature of critical illness is such that sedation therapy in critically ill patients is rarely used for a singular reason. A recent survey of sedation practices in critically ill patients found it is not unusual to have more than one goal for sedation therapy, with critical care nurses identifying comfort, amnesia and patient safety as the most common goals of sedation.[13]

Why then are sedation assessment scales so limited in the domains of sedation that they assess? One reason might be attempts to keep sedation assessment quick and easy for busy clinicians. Another might be that sedation assessment scales were originally designed to evaluate the effects of anesthesia, where consciousness is the primary focus. Certainly this is true for the Ramsay Scale, which was designed to measure consciousness in a study of patients receiving an experimental anesthesia drug during surgery. Regardless, the expert panel concurred that the current scales do not include the necessary parameters needed to adequately evaluate sedation therapy in critically ill patients.

Box Insert #2

Dorrie Fontaine, RN, DNSc, FAAN, Associate Dean, UCSF School of Nursing: "It's probably time to stop using the Ramsay Scale – it's just too simple for our needs. Sedation assessment in the critically ill patient is complex – and we may need to incorporate some type of technology for sedation assessment to make it easy and quick to use at the bedside, but the solution is not to make the assessment scale simple by having only 1 or 2 domains evaluated."

Lorrie Wild, RN, PhD, Director, Patient Care Services, University of Washington Medical Center: "Complex can be managed by today's critical care nurse. Think about hemodynamic monitoring and ICP management by nurses – they are able to assess a variety of physiologic variables and then determine which of many pharmacologic interventions to use."

Question: What is needed to improve sedation assessment in the critically ill patient?

When asked what is needed to improve sedation assessment in the critically ill patient, panel members described various ideal characteristics of a sedation assessment scale (Table 2). The primary recommendation was that an assessment tool be developed that parallels the goals for sedation therapy in critically ill patients. Group discussion centered around having a separate domain or subscale for each of the most common goals for sedation therapy. Ideally, the sedation scale would encourage a multidisciplinary approach to identifying sedation goals.

Box Insert #3

Meg Campbell, RN, MSN, FAAN, Nurse Practitioner, Palliative Care and Clinical Ethics at Detroit Receiving Hospital: "It is critical that a sedation assessment scale be guided by the goals of sedation. For example, if the goal of sedation is ventilator synchrony, then the nurse should be cued into a dimension of the scale that assesses ventilator synchrony and not other dimensions of the sedation scale. Individual patient goals should drive which dimensions of the scale should be used."

Mary Kay Bader, RN, MSN, Neuroscience Clinical Nurse Specialist at Mission Hospital: "Most scales used in critical care today are subjective in nature and are limited to certain domains or subcategories. It is imperative we look for an objective means which could be added to a group of validated parameters providing the practitioner at the bedside with a more comprehensive assessment tool."

The expert panel also recommended that each domain or subscale only evaluate one goal of sedation and avoid combining two or three different goals into the same domain. For example, the current scales often combine agitation, anxiety, and/or level of consciousness into one domain. This creates an assessment problem when for example, agitation increases but anxiety and level of conscious remain unchanged. Should the rating on this domain be decreased, since agitation increased, or stay the same, since anxiety and level of consciousness stayed the same?

The expert panel also thought that it would be important to include both subjective and objective measures/observations of each domain, since many critically ill patients are unable to communicate their status, desires, or perceptions. Patients who are able to communicate their anxiety level would be evaluated with a subjective method such as a visual analog or numeric scale for anxiety. Clinicians would evaluate those unable to communicate by observing behaviors indicative of anxiety (e.g., facial characteristics, behaviors).

Another recommendation was that the sedation assessment scale should direct clinicians to first evaluate and treat pain, and potentially delirium, prior to performing a sedation assessment. There was lively discussion about the problem of inadequate pain management in critically ill patients. Panel members noted that clinicians commonly use sedation therapy to control disruptive behavior when, in fact, the underlying problem is actually one of inadequate analgesia. Sedative drugs do not have analgesic properties, so pain should be treated before sedatives are administered. Adequate pain management may preempt the need for sedation therapy.

Box Insert #4.

Meg Campbell, RN, MSN, FAAN, Nurse Practitioner, Palliative Care and Clinical Ethics at Detroit Receiving Hospital: "If we did a better job of pain management, our need to use benzodiazepines or neuroleptics would dramatically decrease. Sedative therapies should be used as an adjunct to analgesia. Almost all critically ill patients have pain – whether it's sequelae of surgery or iatrogenic pain from procedures or positioning. If pain is addressed adequately, the need for sedation is very, very, small."

An ideal sedation assessment scale should also provide direction to caregivers for clinical management. When clinicians have assessed the appropriate sedation domains, the next step is to determine what, if any, additional treatment is necessary. Panel members were unanimous in their belief that an invaluable addition to the sedation assessment process would be a protocol that could guide the bedside clinician's approach to sedation management.

Box Insert #5.

Marla De Jong, RN, MSN, Doctoral Student, School of Nursing, University of Kentucky: "Protocols and algorithms are useful as teaching tools and as a basis for standing medical orders."

Mary Kay Bader, RN, MSN, Neuroscience Clinical Nurse Specialist at Mission Hospital: "The use of evidenced based protocols allow team members to apply proven appropriate assessment tools to guide interventions found to impact patient outcomes. A standardization of care based on solid scientific evidence not only places the entire team on the same page, it allows for the transfer of science to practice."

And last, but not least, the panel recommended that the ideal sedation assessment tool must to be easy for bedside clinicians to use. Clinicians will not use a tool that is too cumbersome or time-consuming to complete. Given earlier discussions regarding the simplicity and narrow focus of current scales, it is likely that some type of technological application (e.g., PDAs) would keep the assessment process easy, when assessing several domains. Even if eight

domains are included in the sedation assessment scale, clinicians may only need to evaluate three domains when the other five domains do not relate to the patient's goals of therapy.

Question: What subscales or domains should be included in a sedation assessment scale?

Panel members had little hesitation when asked to identify the domains, or subscales, that should be included in a new sedation assessment scale. Consensus was rapidly achieved that the scale needed to include the following domains: anxiety, sleep / rest, consciousness, agitation / restlessness, prevention of self harm, amnesia, and comfort. Other items that were suggested but had less than unanimous support included: delirium, pain, fear, patient-ventilator synchrony, and physiologic signs.

Box Insert #6.

Marla De Jong, RN, MSN, Doctoral Student, School of Nursing, University of Kentucky: "Changes in physiologic signs (for example, heart rate, blood pressure, respiratory rate) are inherently difficult to put into a separate domain. And, changes in physiologic variables may be related to other phenomenon that are unrelated to the domains of sedation."

Lorrie Wild, RN, PhD, Director, Patient Care Services, University of Washington Medical Center: "Ventilator synchrony, while a goal sometimes of sedation management, may not really be a separate domain but should be included in the agitation domain as a level that includes 'not tolerating medical treatments / devices."

Substantial discussion revolved around the inclusion of pain and delirium as individual domains in a sedation assessment scale. Many members felt that while pain and delirium are important concepts, they do not resolve with sedative agents, making them inappropriate to include in the actual sedation assessment scale. While everyone agreed that critically ill patients have a high incidence of pain and delirium, the panel believed that management of pain and delirium should be separate from sedation assessment and management. The panel's strongest

recommendation was that the sedation assessment scale's directions include reminder to first assess and manage pain and delirium.

Box Insert #7.

Kathleen Vollman, RN, MSN, Clinical Nurse Specialist/Educator/Consultant: Assessment of delirium should occur after pain and other potential physiologic causes for agitation are ruled out. Then delirium should be assessed, followed by assessment of motor activity."

Meg Campbell, RN, MSN, FAAN, Nurse Practitioner, Palliative Care and Clinical Ethics at Detroit Receiving Hospital: "I'm worried that if we assess for delirium first, by itself, we'll end up labeling the patient as delirious and jump to treatment with a neuroleptic and not recognize that the real problem is anxiety or poor pain management. Betty Ferrel's work with nursing home patients that were labeled delirious found that those patients were grossly undermedicated for pain. The label of delirium can lead to the wrong treatment

Suzi Burns, RN MSN, Associate Professor of Nursing, University of Virginia Health System: I agree with you Meg. It's the part I'm struggling with – how can we come to a diagnosis upfront before we have done a thorough, accurate assessment? You may decide it's delirium, and treat with neuroleptic drugs without excluding pain, or anxiety or other causes. If we don't do that thorough assessment, we skip a step and then many patients will be labeled as delirious and treated with neuroleptics instead of what they may need."

Dorrie Fontaine, RN, DNSc, FAAN, Associate Dean, UCSF School of Nursing: "Is it that delirium is really the outcome of poor control of pain, or anxiety, or due to sleep deprivation? What comes first, the chicken or the egg?"

The domains or subscales proposed by the members of the expert panel were initially a list of individual domains related to the goals of sedative therapy (Table 3). As the discussion of the items progressed, and after thoughtful reflection, a logical grouping of the individual domains emerged into 3 categories (Figure 2). The grouping of the domains into the categories of physiological stability, comfort, and patient safety, helped the panel members to better conceptualize the sedation assessment and management process.

Panel members recommended that for each domain, both subjective and objective methods for evaluating the domain be included, if appropriate. This type of approach would

ensure applicability of the scale to both responsive and unresponsive patients. For example, subjective measures of a domain might include the patient's self report of his or her status vis-à-vis the domain, while and objective measures might include observation of facial expressions, body movements, or physiological variables.

Although a one-day meeting did not afford enough time to completely develop the assessment tool, panel members identified the two anchors, or ends, for each domain or subscale (Table 4). Prior to testing the new scale, additional work will need to be done at a later time to complete the intermediate levels between the two anchoring points. In defining the levels for each domain, it will be important to assure they are in alignment with the effect produced by current sedative agents. For example, the alpha agonist dexmetatomidine is a newer sedative agent that creates a unique sedation state that is difficult to assess with a currently available sedation scale. Sedated patients are asleep but can be easily aroused by verbal or light touch stimuli. Once awake, patients exhibit clear speech and thinking, yet rapidly fall back to sleep.[15,16] Because of it's clinical profile, evaluating patients receiving dexmetatomidine with the current sedation tools can easily lead to erroneous ratings and overdoses of the sedative agent.

Question: What are the challenges to assuring that critically ill patients' sedation needs are adequately addressed?

The panel discussed the challenges that exist to assuring that critically ill patients' sedation needs are addressed. First, and foremost, is the challenge to develop a sedation assessment tool that evaluates the range of domains applicable to the variety of clinical uses of sedation management in critical care. Everyone agreed that the approach being taken by the Abbott / AACN / Saint Thomas Health System collaboration is an excellent beginning in

addressing that challenge. While much work remains to be done before a final scale is finished, the panel members clearly witnessed the partners' commitment to this groundbreaking venture.

The next challenge, then, will be to conduct validity and reliability testing of the new scale in a variety of critically ill patients. In addition to medical, surgical, and cardiovascular critically ill patients, it will be important to test the new scale in patients with neurological impairment or severe respiratory failure that initially requires ventilatory control and later weaning from mechanical ventilation. Testing should also be done for patients who receive sedation to facilitate short-term procedures or transport within the hospital.

Box Insert #8.

Dorrie Fontaine, RN, DNSc, FAAN, Associate Dean, UCSF School of Nursing: "I would hope that this would be a widely used tool, so the broader testing of the tool in a range of acutely ill patient is what is needed."

The panel recommended an intensive focus on validity testing, which should not only compare the new scale to existing scales, but also to use technology and biological markers as reference standards for each domain, where appropriate. Suggested reference standards included electroencephalogram (EEG) and bispectral index (BIS) monitoring for the consciousness domain, polysomnography for the sleep/rest domain, quantification of movement with the actigraph for the agitation and patient safety domains, facial electromylography (EMG) monitoring for fear, and catecholamine levels for the anxiety/fear domain. The panel also recommended enlisting a group of clinical experts to rate each domain to establish reference standards for the tool.

In addition to validity testing on the instrument, studies to determine the reliability of the tool will also be needed. Both inter-rater reliability among nurses using the tool and reliability of

assessments using the tool with the same patients over time and across patient populations will be important.

Once a valid and reliable, multidomain sedation assessment scale has been developed and tested, the next challenge will be to develop algorithms to guide clinicians through the maze of sedation management possibilities. This step, while potentially one of the most challenging, is crucial to assure optimal sedation management in the critically ill patient.

Future Direction

The convening of the Sedation Expert Panel was just the first step in the collaboration of Abbott Laboratories, AACN, and Saint Thomas Health System. Guided by the wisdom of the expert panel members, Phase II of the project is currently in progress. Further refinement of the sedation assessment scale is occurring, with plans for preliminary testing of the scale within the next year. Wide scale clinical testing, Phase III of the project, is hoped to begin late in 2004. While much remains to be done to achieve the goal, the journey has begun.

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Key Points

Sedation assessment is an important component of care for patients receiving sedative agents and/or for patients with agitation or decreased level of consciousness. Despite the importance and frequency of this nursing assessment, current assessment scales are limited in their ability to adequately evaluate critically ill patients. This article summarizes the views of experts presented at a consensus conference on sedation assessment in critical care, including recommendations for future development of a sedation assessment scale.

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Table 1. Four different sedation assessment scales with validity and reliability in adult patients.

Ramsay Scale[2]	Sedation-Agitation Scale[4]	Motor Activity Assessment Scale[3]	Richmond Agitation Sedation Scale[5,6]
6 No response	1 Unarousable (minimal or no response to noxious stimuli, does not communicate or follow commands)	0 Unresponsive (does not move with noxious stimuli)	-5 Unresponsive (no response to voice or physical stimulation)
5 Patient asleep with a sluggish response to a light glabellar tap	2 Very sedated (arouses to physical stimuli but does not communicate or follow commands, may move spontaneously)	1 Responsive only to noxious stimuli (opens eyes or raises eyebrows or turns head toward stimulus or moves limb with noxious stimulus)	-4 Deep sedation (no response to voice, but any movement to physical stimulation
4 Patient asleep with a brisk response to a light glabellar tap	3 Sedated (difficult to arouse, awakens to verbal stimuli or gentle shaking but drifts off again, follows simple commands)	2 Responsive to touch or name (open eyes or raises eyebrows or turns head toward stimulus or moves limb when touched or name is loudly spoken)	-3 Moderate sedation (any movement, but no eye contact to voice)
3 Patient responds to commands only	4 Calm and cooperative (calm, awakens easily, follows commands)	3 Calm and cooperative (no external stimulus is required to elicit movement purposefully and follows command)	-2 Light sedation (briefly, less than 10 sec, awakening with eye contact to voice)
2 Patient co-operative, oriented and tranquil	5 Agitated (anxious or mildly agitated, attempting to sit up, calms down to verbal instructions)	4 Restless and cooperative (no external stimulus is required to elicit movement and patient is picking at sheets or tubes or uncovering self and follows commands)	-1 Drowsy (not fully alert, but has sustained, more than 10 sec, awakening with eye contact to voice)
1 Patient anxious or agitated or both	6 Very agitated (does not calm, despite frequent verbal reminding of limits; requires physical restraints, biting ET tube)	5 Agitated (No external stimulus is required to elicit movement and attempting to sit up or moves limbs out of bed and does not consistently follow commands)	0 Alert and calm
	7 Dangerous agitation (pulling at ET tube, trying to remove catheter, climbing over bed rail, striking at staff, thrashing side to side)	6 Dangerously agitated, uncooperative (no external stimulus is required to elicit movement and patient is pulling at tubes or catheters or thrashing side to side or striking at staff or trying to climb out of bed and does not calm down when asked)	1 Restless (anxious or apprehensive but movements not aggressive or vigorous)
			2 Agitated (frequent nonpurposeful movement or patient-ventilator dysynchrony)
			3 Very agitated (pulls on or removes tubes or catheters or has aggressive behavior toward staff)
			4 Combative (overly combative or violent; immediate danger to staff)

Table 2. Sedation Expert Panel recommendations for an ideal sedation assessment scale.

- Assessment scale should have domains to represent each of the goals for sedation assessment. Ideally, the scale would encourage a multidisciplinary approach to identifying goals of sedation therapy prior to assessing sedation.
- Each domain of the assessment scale should evaluate only one goal and avoid combining two different concepts into the same domain.
- Both subjective and objective measures for each domain should be assessed, if appropriate.
- Assessment scale should direct clinicians to evaluate and treat pain, and potentially delirium, prior to performing a sedation assessment.
- The scale should be easy for clinicians to use at the bedside. Use of technology (e.g., PDA or computer) to simplify complex scale should be developed.

Table 3. Initial list of domains for inclusion in a new sedation assessment scale.

- Anxiety
- Comfort
- Agitation
- Amnesia
- Sleep / Rest
- Consciousness / Arousal
- Potential for Self-Harm
- Patient/Ventilator Synchrony - ?
- Delirium - ?
- Pain - ?
- Fear - ?
- Physiologic Signs - ?

Table 4. Proposed anchors for each domain of a new sedation assessment scale.

Domain	Anchor End	Anchor End
Patient Safety		
• Arousability:	Awake	No arousal to physical stimuli
• Agitation	Calm	Very agitated
• Behavior	Tolerates treatment	Frequent behavior dangerous to self or others
Physiologic Stability		
• Hemodynamic Stability	BP / HR / CI fluctuations < 15%	BP / HR / CI fluctuations > = 15%
• Ventilator Synchrony	Synchrony with vent	Complete dysynchrony with vent
Psychological Comfort		
• Anxiety	No anxiety	Severe anxiety
• Fear	No fear	Terrified
• Sleep / Rest	Balanced sleep	Insomnia
• Amnesia	No recall or pleasant recall	Vivid recall

Figure 2. Domains proposed for a new sedation assessment scale.